FIRST ARTICLE REQUIREMENTS

(AFMCI 64-110, AFMCI 23-102 and FAR Part 9, Sub Part 9.3) (Additional Instructions on Page 3)

1. DATE: 24 May 03

2. P/R/MIPR NUMBER:

3. PART NUMBER: 4033920

4. NSN: 2840-00-367-8224NZ

5. FIRST ARTICLE QUANTITY

THE FIRST ARTICLE IS 3 UNIT(S) OF LOT/ITEM 1

AND WILL BE: [ ] PART OF PRODUCTION QUANTITY [X] IN ADDITION TO PRODUCTION QUANTITY

6. ARTICLES

[ ] WILL [X] WILL NOT SERVE AS A MANUFACTURING STANDARD

7. LONG LEAD TIME ITEMS

[X] REQUIRED [ ] NOT REQUIRED

(See FAR 52.209-3 or -4, alternate II)

8. SPECIAL REQUIREMENT/PRODUCTION FACILITIES *(See FAR 52.209-3 or -4 Alternate I)*

[X] REQUIRED [ ] NOT REQUIRED

"The First Article offered must be manufactured at the facilities in which that item is to be produced under the contract, or if the First Article is a component not manufactured by the contractor, such component must be manufactured at the facilities in which the component is to be produced for the contract. A certification to this effect must accompay each First Article which is offered."

9. TEST/INSPECTION REQUIREMENTS

A. [X] CONTRACTOR TESTING [ ] GOVERNMENT TESTING

Performance or other characteristics which the First Articles must meet are identified in drawing 4027647 and specifications identified therin.

B. The detailed technical requirements for First Article approval tests are contained in Block 12 of this form and LPF-QAR-003

(Cite Spec and Para number)

C. [X] TEST PLAN REQUIRED

(1) DD Form 1423 ELIN A001

(2) Delivery due 30 calendar days from date of contract.

(3) Number of days for government approval/disapproval 45 days.

D. Contractor's notification to ACO and PCO *(Requesting Activity)* of test time and location due 10 days prior to start of testing.

E. [X] TEST REPORT REQUIRED

(1) DD Form 1423 ELIN A002

(2) Due 120 calendar days from date of contract.

(3) Forwarded to ENRS PCO & OC-ALC/~~TICLA~~, 3001 Staff Dr. Ste T69 Tinker, OK 73145-3036, Attn EA Montr

(4) Government written notice of approval/disapproval due 60 days after receipt of contractor's report.

F. FIRST ARTICLE DELIVERY:

(1) Due within _____ calendar days from date contract.

(2) Notify _____ calendar days prior to shipment.

(3) Delivered to government at

(Set Forth Consignee and Address)

(4) Government written notice of approval/disapproval within 60 days after receipt of first article package.

G. Estimated cost of government testing/inspection evaluation.

$ $2,500.00

10. DISPOSITION OF FIRST ARTICLES

[ ] Approved First Articles will be forwarded to _____

[X] 1 *(insert quantity)*. first articles will be expended intesting. Residual components of disapproved first articles [ ] will be returned to the contractor/ [ ] will be retained by _____ pending disposition instructions from the contractor.

[ ] First articles will be installed on aircraft/equipment to determine proper fit/function. Approved article will remain on the aircraft/equipment and will not be forwarded to USAF Supply, but will be considered part of the contract quantity.

[ ] Disapproved first articles will be returned to the contractor/ [ ] will be retained by _____ pending disposition instructions from the contractor

[ ] On purchase requests designated as direct shipments the following disposition will apply. (NOTE: Always applicable on Foreign Military Sales (FMS)).

a. Approved first articles will be returned to the contractor for shipment with production item.

b. Disposition of disapproved first articles will remain the same as marked above.

[X] Other Disposition: See Block 12 of this Form

ENRS/M.FRASER/29MAY03

11. CONDITION(S) FOR WAIVER OF FIRST ARTICLE APPROVAL

a. [X] Offerors who have previously furnished production quantities of the same or similar article to the prime contractor for delivery to the X Government, X DoD, X Air Force.

b. [ ] Offerors currently in production of the same or similar article for a _____ Government, _____ DoD, _____ Air Forceontract and who have received First Article approval under the existing contract.

c. [X] Offerors who have previously furnished production quantities of the same or similar articles for a X Government, X DoD, X Air Force provided articles thus furnished have exhibited satisfactory performance in service, in the opinion of the Air Force.

d. [X] Provided not more than 36 months have elapsed since completion of the contract.

e. [ ] First Article testing will not be waived.

f. [X] See Remarks in block 12 below.

NOTE TO BUYER: UNDER CONDITIONS A AND C ABOVE, THE COGNIZANT ENGINEERING ACTIVITY WILL DECIDE WHETHER OR NOT THE ITEM HAS EXHIBITED SATISFACTORY PERFORMANCE IN SERVICE AND PREPARE AND RETAIN SUPPORTING DOCUMENTATION TO FULLY JUSTIFY THIS DECISION. THE BUYER MUST SOLICIT DUAL PRICES *(That is, both with and without requirement for first article approval)* AND MUST FURNISH THE COGNIZANT ENGINEERING ACTIVITY WITH THE FOLLOWING INFORMATION ON THE PREVIOUSLY SUPPLIED ARTICLE:

A. PROCURING OFFICE	B. CONTRACT NUMBER	C. DATE OF CONTRACT	D. SPECIFICATION NUMBER AND REVISION

12. REMARKS

9.B. First article test requirements shall be per LPF-QAR-003 and the following:

a. All three first articles shall be inspected in accordance with the requirements of paragraphs 3.1, 3.2, 3.3, 3.4, and 3.5 of LPF-QAR-003.

b. After completion of inspections per 9.B.a above, one article shall be destructively tested/evaluated in accordance with the requirements of paragraph 3.6 of LPF-QAR-003.

10. Disposition of First Articles:

a. Approved first articles will be retained at the contractor's facility for reconditioning (if necessary) with final acceptance the same as for production items. If a first article is expended in testing, approval of first article will constitute acceptance.

b. Disapproved first articles shall be retained at the contractor's facility, unless specified otherwise by the PCO.

11. The cognizant government engineering authority shall be the final authority for determining if a contractor meets the conditions of waiver identified in 11.a , or 11.c.

First article testing is waived if the offeror is the prime contractor (OEM), Pratt & Whitney.

This is a critical part used in the F100 series turbine engine. Poor quality parts will have an adverse effect on mission capability and system safety. for this reason, First Article Testing is required to insure first time manufacturers or manufacturers that have not produced the item within three years manufacture parts in accordance with the drawing and specification requirements.

13. COGNIZANT ENG ORGANIZATION RESPONSIBLE FOR CONDUCTING AND/OR APPROVING TEST *(Name, Organization, Phone)*	14. PR INITIATOR *(Name, Organization, Phone)*
Hank Schank, OC-ALC/LPFRB, DSN 884-8790 Hank Schank 24 MAY 03	

CONTRACT DATA REQUIREMENTS LIST

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY: TDP TM OTHER

D. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR
P/N 4033920		

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A001	FIRST ARTICLE TEST PLAN	NSN: 2840-00-367-8224NZ Noun: Augmentor Nozzle Support Asy

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-NDTI-80809		OC-ALC/LPFR

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
YES		ONCE	SEE BLOCK 16
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT**
		SEE BLOCK 16	

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE

16. REMARKS

Contractor must provide a plan to ensure that all drawing requirements are met on each first article. The plan should include the equipment and facilities utilized to verify all drawing requirements. As a minimum , the following information is required.

a. A list of all drawing dimensions, tolerances, and the equipment utilized to verify each dimension. An actual drawing should be submitted to correlate with the dimension list.

b. A plan to verify that all non-destructive inspections are met.

c. A plan to verify that all visual inspections requirements are met.

d. A plan to verify material properties to include mechanical properties, metallurgical, and chemical compositions.

e. A plan to ensure that manufacturing processes are performed by OEM (PWA) certified vendors.

f. A plan to ensure that the forging/casting source is OEM certified, if applicable.

Guidelines for first article test plans are contained within LPF-QAR-003 as an attachment.

A government representative must coordinate on the First Article Test Plan. The First Article Test Plan shall be received 30 calendar days from the date of contract.

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES Draft	Final Reg	Final Repro
OC-ALC/ENRS		2	
3001 STAFF DR			
STE T69			
OK 73145-3036			
ATTN: FA			
MONITOR			
DSCR - JLP			1
Richmond VA			
23297-5877			
DCM - QAR			1
Local DCMA			
15. TOTAL →		2	2

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
Hank Schank/LPFR Hank Schank	24 MAY 03		

CONTRACT DATA REQUIREMENTS LIST

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY: TDP TM OTHER

D. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR
P/N 4033920		

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A002	FIRST ARTICLE TEST REPORT	NSN: 2840-00-367-8224NZ Noun: Augmentor Nozzle Support Asy

4. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-NDTI-80809		OC-ALC/LPFR

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
YES		ONCE	SEE BLOCK 16
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT**
		SEE BLOCK 16	

17. PRICE GROUP
18. ESTIMATED TOTAL PRICE

16. REMARKS

The First Article Test Report shall satisfy all requirements in the First Article Test Plan. All drawing requirements must be satisfied including dimensions, visual inspections, non-destructive inspections (NDI), manufacturing processes, and material requirements. The test report shall indicate the subvendors utilized to perform all manufacturing processes and assure they are OEM (PWA) certified to perform that process. A copy of the part process sheets shall also be provided. A government representative must coordinate on the test report. Guidelines for the test reports are contained within LPF-QAR-003 which is attached.

The First Article Test Report shall be received at OC-ALC/EVRS not later than 120 calendar days from the date of the contract.

14. DISTRIBUTION			
a. ADDRESSEE	b. COPIES		
	Draft	Final Reg	Final Repro
OC-ALC/ENRS		2	
3001 STAFF DR			
STE T69			
OK 73145-3036			
ATTN: FA			
MONITOR			
DSCR - JLP			1
Richmond VA			
23297-5877			
DCM - QAR			1
Local DCMA			
15. TOTAL →		2	2

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
Hank Schank/LPFR	24 MAY 03		

DD Form 1423-1 JUN 90 *(EF)* PREVIOUS EDITIONS ARE OBSOLETE. Page 2 of 2 Pages

INSTRUCTIONS FOR COMPLETING DD FORM 1423

(See DoD 5010.12-M for detailed instructions.)

FOR GOVERNMENT PERSONNEL

Item A. Self-explanatory.

Item B. Self-explanatory.

Item C. Mark (X) appropriate category: TDP - Technical Data Package; TM - Technical Manual; Other - other category of data, such as "Provisioning,""Configuration Management," etc.

Item D. Enter name of system/item being acquired that data will support.

Item E. Self-explanatory (to be filled in after contract award).

Item F. Self-explanatory (to be filled in after contract award).

Item G. Signature of preparer of CDRL.

Item H. Date CDRL was prepared.

Item I. Signature of CDRL approval authority.

Item J. Date CDRL was approved.

Item 1. See DoD FAR Supplement Subpart 4.71 for proper numbering.

Item 2. Enter title as it appears on data acquisition document cited in Item 4.

Item 3. Enter subtitle of data item for further definition of data item (optional entry).

Item 4. Enter Data Item Description (DID) number, military specification number, or military standard number listed in DoD 5010.12-L (AMSDL), or one-time DID number, that defines data content and format requirements.

Item 5. Enter reference to tasking in contract that generates requirement for the data item (e.g., Statement of Work paragraph number).

Item 6. Enter technical office responsible for ensuring adequacy of the data item.

Item 7. Specify requirement for inspection/acceptance of the data item by the Government.

Item 8. Specify requirement for approval of a draft before preparation of the final data item.

Item 9. For technical data, specify requirement for contractor to mark the appropriate distribution statement on the data (ref. DoDD 5230.24).

Item 10. Specify number of times data items are to be delivered.

Item 11. Specify as-of date of data item, when applicable.

Item 12. Specify when first submittal is required.

Item 13. Specify when subsequent submittals are required, when applicable.

Item 14. Enter addressees and number of draft/final copies to be delivered to each addressee. Explain reproducible copies in Item 16.

Item 15. Enter total number of draft/final copies to be delivered.

Item 16. Use for additional/clarifying information for Items 1 through 15. Examples are: Tailoring of documents cited in Item 4; Clarification of submittal dates in Items 12 and 13; Explanation of reproducible copies in Item 14.; Desired medium for delivery of the data item.

FOR THE CONTRACTOR

Item 17. Specify appropriate price group from one of the following groups of effort in developing estimated prices for each data item listed on the DD Form 1423.

a. Group I. Definition - Data which is not otherwise essential to the contractor's performance of the primary contracted effort (production, development, testing, and administration) but which is required by DD Form 1423.

Estimated Price - Costs to be included under Group I are those applicable to preparing and assembling the data item in conformance with Government requirements, and the administration and other expenses related to reproducing and delivering such data items to the Government.

b. Group II. Definition - Data which is essential to the performance of the primary contracted effort but the contractor is required to perform additional work to conform to Government requirements with regard to depth of content, format, frequency of submittal, preparation, control, or quality of the data item.

Estimated Price - Costs to be included under Group II are those incurred over and above the cost of the essential data item without conforming to Government requirements, and the administrative and other expenses related to reproducing and delivering such data item to the Government.

c. Group III. Definition - Data which the contractor must develop for his internal use in performance of the primary contracted effort and does not require any substantial change to conform to Government requirements with regard to depth of content, format, frequency of submittal, preparation, control, and quality of the data item.

Estimated Price - Costs to be included under Group III are the administrative and other expenses related to reproducing and delivering such data item to the Government.

d. Group IV. Definition - Data which is developed by the contractor as part of his normal operating procedures and his effort in supplying these data to the Government is minimal.

Estimated Price - Group IV items should normally be shown on the DD Form 1423 at no cost.

Item 18. For each data item, enter an amount equal to that portion of the total price which is estimated to be attributable to the production or development for the Government of that item of data. These estimated data prices shall be developed only from those costs which will be incurred as a direct result of the requirement to supply the data, over and above those costs which would otherwise be incurred in performance of the contract if no data were required. The estimated data prices shall not include any amount for rights in data. The Government's right to use the data shall be governed by the pertinent provisions of the contract.

U.S. AIR FORCE

LPF-QAR- 003
LPFR QUALITY ASSURANCE REQUIREMENTS FOR FIRST ARTICLE TEST PLANS & REPORTS

1. This document provides guidelines for the preparation of first article test plans/test reports for F100 engine parts where referenced within the first article data of a contract.

2. FIRST ARTICLE QUANTITY. The quantity of first articles shall be per the contract. The quantity of articles allowed for destructive testing, in accordance with the contract, shall be tested per the first article procedure in its entirety, to include the destructive testing. The remaining articles shall only be tested per the nondestructive portions of the procedure.

3. TESTING REQUIREMENTS.

3.1. Testing shall consist of, but shall not be limited to, the verification of the following.

3.1.1. Dimensional conformance including finish requirements.

3.1.2. Conformance to non-destructive inspection requirements (FPI, Ultra-sonic, Eddy Current, X-ray, visual)

3.1.3. Conformance of material properties to include mechanical, metallurgical and chemical.

3.1.4. Conformance to other required processes, specifications, and standards listed on the drawing including sub-tier specifications and standards, special requirements as described in the engineering instructions (EI), quality plans, etc.

3.2. First articles shall be serialized. Serial Numbers are to be identified prior to commencement of testing unless otherwise specified.

3.3. Dimensional Inspection.

3.3.1. All dimensions, as listed on the assembly drawing and detail drawings, to include drawing notes, shall be measured where possible on all first articles 100% (no sampling allowed).

3.3.2. A tabular format shall be used with drawing dimension, tolerance, measurement, and instrument/gage/tooling/serial number used.

3.3.3. All tooling and gaging used for inspection and acceptance/rejection of first articles shall have calibrations from a laboratory traceable to NIST and in

accordance with ISO 10012-1 (formerly MIL-STD-45662), listed in a (tooling & gaging table) table, table shall include nomenclature, serial number, calibration frequency, next calibration date, range, least increment, and accuracy. Listing shall also include alignment tools and constraint fixtures.

3.3.4. Inspection results shall be presented in a table showing the feature measured, dimension and tolerance, actual reading and gage serial number used.

3.4. Nondestructive Inspections (NDI), including Fluorescent Penetrant Inspections (FPI), Ultrasonic Testing (UT), Eddy Current (EC), Radiographic Testing (x-ray), and visual inspections, shall comply with LPR-QPR-018 and meet the following:

3.4.1. All first articles shall receive 100% of the inspections identified on the QAD. Sampling shall not be allowed.

3.4.2. NDI shall be per the applicable specification(s).

3.4.3. Sources used shall be Pratt & Whitney approved per the OC-ALC/LPFR letter granting source approval to the contractor.

3.4.4. NDI results shall be presented in a table showing the feature inspected, acceptance/rejection criteria used, results and gage/master serial number used. In cases where photographic standards within a VIS specification are applied to an NDI, the inspection report shall include a copy.

3.4.5. Inspection Masters/Transfer Masters shall have current calibrations. A copy of the calibration(s) shall be included into the report.

3.4.6. Level III or Level II inspectors, as applicable, shall be required. A copy of the inspector's certification(s) shall be included into the report.

3.5. Visual Inspections shall include:

3.5.1. Specific visual inspections per a Pratt & Whitney Visual Inspection Standard (VIS) document shall be called out of the applicable VIS and cited as specific inspections.

3.5.2. Visual inspection results shall be presented in a table showing the feature inspected, acceptance/rejection criteria used, results, and gage/master serial number used (as applicable).

3.5.3. In cases where photographic standards within the VIS are used, the inspection report shall include a copy.

3.6. Material properties testing shall include mechanical properties, metallurgical properties, and chemical composition tests, as applicable, per the material specifications and the following:

3.6.1. Composition, heat treat condition, and other characteristics/properties, as listed in the technical requirements section, acceptance section, and/or quality sections of the specification(s) so as to verify that the materials and processes are sound, clean, and free of imperfections detrimental to the performance of the part or assemblies.

3.6.2. In some cases a material suppliers certification will not be sufficient and the Contractor shall have redundant testing performed.

3.6.3. Metallurgical microanalysis, as applicable, for raw materials, welds, brazings, and coatings shall be conducted. Results shall include the complete laboratory report including photomicrographs.

3.6.4. Mechanical testing, as applicable, per manufacturing specifications and the drawing(s).

3.6.5. In cases where the applicable specifications require test reports, these shall accompany the First Article Test Report (FATR).

4. SUBMITTAL.

4.1. The First Article Test Plan (FATP) shall be delivered to the Contracting Officer in accordance with the schedule as listed in the contract, or Form DD1423. The FATP shall provide a detailed description of specific testing instructions to be used. Generalized instructions will not be acceptable.

4.2. The First Article Test Report (FATR) shall be delivered to the Contracting Officer in accordance with the schedule as listed in the contract, or Form DD1423. All laboratory test results, including those resultant from testing conducted at the contractor's facility and including sub-vendor testing, shall be provided with the FATR in their complete form as provided by the testing laboratory(ies).

5. DISPOSITION OF PARTS.

5.1. When required by the contract, the remnants from destructive testing shall be delivered with the First Article Test Report.

5.2. When required by the contract and following the completion of non-destructive testing, one article shall be delivered to the Contracting Officer and packaged in accordance with contract requirements. Marking on the package shall be

UNSERVICEABLE - Condition Code "R". Deliver this part with the First Article Test Report. The other(s) shall be handled in accordance with the contract.

6. GENERAL REQUIREMENTS.

6.1. All First Articles and all Production Articles shall be fabricated from material whose metallurgical state is in compliance with the drawing requirements, as well as all sub-tier specifications and standards referenced therein.

6.2. All First Articles and all Production Articles shall be new manufactured under this contract. No items manufactured under previous contracts shall be delivered without approval.

6.3. The subcontractors previously identified by the contractor as sources to be employed, to include laboratory testing, shall be the only sources used. If the contractor wishes to employ a subcontractor other than previously identified, they shall substantiate that the new source is OEM approved for the specific testing required. A change in the address of a source shall be construed as a change of source. Employment of alternate sources shall only be authorized by OC-ALC/LPFR.

Engineering Instructions shall take precedence over all other technical instructions.

GRIZELDA LOY-KRAFT, Chief
F100 Engineering Source Approval
Fighter Propulsion Division
Propulsion Directorate

[redacted] ATTACHMENT #2

QUALIFICATION REQUIREMENTS FOR MANUFACTURE OF F100 ENGINE PARTS

P/N: 4033920 Rev: 5
NSN: 2840003678224 02-Mar-01

I. HARDWARE DESCRIPTION

A. Nomenclature:
LOCK

B. Function:
Provides locking capability for the short link pivot pin at the convergent nozzle segment link tower.

C. Material Composition:
AMS 5540 Nickel Alloy

II. REFERENCE DOCUMENTS

LPF-QAR-004 - General Quality Assurance Requirements for F100 Engine Components.

III. JUSTIFICATION FOR QUALIFICATION REQUIREMENTS

Ref.: FAR Subpart 9.2, AFMCFAR Subpart 5309.2

The following paragraphs provide the justification for qualification requirements for this part.

A. Criticality of Part:

This is a Critical Application Item (CAI) used on the F-15 and F-16 aircraft primary propulsion system, the Pratt & Whitney F100 engine. Failure of this part can result in secondary damage to the engine and subsequent mission abort.

B. Complexity of Part:

This part is not complex to manufacture, however, it is used in a critical location and must therefore require strict process control and quality standards.

C. Government Risk:

The following paragraphs document the reasons why the risk to the government of buying this part from an unqualified source is compound.

1. The probability of an unqualified source producing an unsatisfactory part is high.

2. The probability of an unqualified source failing to produce within schedule is high.

3. A high potential exists for an unqualified source to underestimate the manufacturing difficulty and miss critical delivery schedules.

4. Untimely delivery critically impacts end item overhaul/repair schedules. Failure to deliver on schedule may result in additional high cost emergency procurements.

5. An inferior part can cause extensive damage to the end item resulting in a high cost of repair.

D. There are no costs incurred by an offeror for qualification testing and testing evaluation under the requirements of paragraphs VI.A or VI.B. However, the offeror's development of a Source Approval Request (SAR) package to be submitted for Government evaluation may cost as much as $2500. In addition, the cost incurred by offerors for Government evaluation of their SAR submitted under the requirements of paragraphs VI.A or VI.B may be as much as $1,200. This cost may be borne by the Government if it is in the best interest of the Government to qualify alternate sources.

IV. JUSTIFICATION FOR QUALIFICATION PRIOR TO CONTRACT AWARD
Ref.: AFMCFAR Subpart 5309.2

The following paragraphs provide the rationale for requiring a demonstration of the qualification requirements prior to contract award.

A. The risk of default by the contractor must be minimized as the shortest combined administrative and production lead-time is over 22 months.

B. The technical risk must also be minimized due to the criticality of the part (Reference the section "Criticality of Part" in paragraph III.A).

C. The manufacturing and processing techniques are critical to performance and reliability (Reference the section "Criticality of Part" in paragraph III.A).

D. The risk to the government in determining a potential vendor's capability without an actual demonstration of that capability must be minimized. The expertise that is required to manufacture this part is not commonly available or easily obtained and therefore must be demonstrated. (Reference the section "Complexity of Part" in paragraph III.B).

V. DATA AND DOCUMENTATION REQUIREMENTS

The following paragraphs document the data that must be submitted with a request for source approval. All documentation submitted shall be the latest revision published. Documentation shall be bound (preferably a three ring binder) with a table of contents and corresponding sections tabbed.

A. The potential Offeror must substantiate that they possess latest revision of the following data by providing a copy in the source approval package, or must provide DCMA or other government representative written verification that the potential vendor has the latest revision of the following data:

1. Drawing Number: 4033920 (Including all sub-assembly or detail drawings specified on this drawing number)

2. Quality Assurance Data (QAD): 4033920 As applicable, include the QAD for each sub-assembly or detail part listed on the above drawing.

3. All applicable specifications called out on the drawing, and/or assembly and detail drawings, and on the QAD (as applicable). These include:

   a) Process Specifications
   b) Inspection Processes
   c) Material Specifications

B. The potential Offeror's Quality Assurance System must meet or exceed the requirements described in the attached document LPF-QAR-004.

C. The vendor shall supply a list of all manufacturing and inspection processes that will be performed, both in-house or by sub-vendors. The vendor shall substantiate that sources to be employed for any significant process, including themselves, with the exception of conventional metal removal processes, are currently approved by Pratt & Whitney (P&W) for the specific process required or another OEM for an equivalent process. The vendor must supply the name and address of each certified vendor to be used. In all cases where process approval is relative to an OEM process specification other than Pratt & Whitney, the vendor shall provide the complete specification and demonstrate the equivalence of the specifications.

VI. SUBSTANTIATION OF MANUFACTURING CAPABILITY

The following paragraphs document the methods to be used to substantiate a vendor's capability to manufacture this item.

A. A vendor who has manufactured the item for the prime contractor (P&W), another engine OEM, or for other United States Department of Defense users of the same item within the last five years may be approved as a source for the part provided the vendor was responsible for all material procurement, inspection, and finishing of the end item, i.e., the prime manufacturer, P&W, or other engine OEM did not add any value to the end item. The vendor must submit evidence of the scope of work for the part indicating that they had primary responsibility for all operations necessary for the completion of the part for delivery to the customer. This evidence shall include MANUFACTURING PROCESS SHEETS.

B. Other vendors will be considered for approval on the basis of their ability to manufacture a similar item for the prime contractor (P&W), another engine OEM, the United States Department of Defense, or a NATO country. The following conditions must be met for approval by similarity:

   1. Submit evidence of the successful manufacture and sale of the similar item, to include purchase orders and shipping documents reflecting production quantities within the last five

years. This evidence must document that the vendor had primary responsibility for all operations necessary to produce the similar item, and that the similar item was accepted by the customer. Also include a summary of quality deficiencies experienced within the last two years of production of the similar item(s) with coordination from the Q. A. manager. The vendor shall provide SPECIFIC similarities and differences between the subject part and the similar part.

2. The vendor shall substantiate that the similar component(s) submitted will satisfy the following criteria:

   a) Fabricated of the same alloy or an alloy from the same alloy family, e.g. Alpha Titanium's, Inconels, Austenitic Stainless Steels.

   b) Illustrates the ability of the vendor, in conjunction with their sub-vendors, to perform all significant processes to be employed and maintain requisite tolerances and surface finish requirements.

   c) The data must also show that the manufacturing and inspection/test processes for the similar part demonstrate the full range of difficulty required for the subject part. Included in this data shall be complete MANUFACTURING PROCESS SHEETS for the similar item.

3. A first article requirement may be included in any contract resulting from approval based upon similarity. The estimated cost of first article testing is $900.00. These tests may include material properties analysis, dimensional analysis, and possibly rig test. At least three first articles would be required with one first article requiring destructive testing.

VII. RESPONSIBLE ENGINEERING ORGANIZATION

The responsible organization for establishing these qualification requirements is the F100 Engine Engineering Branch, within the Fighter Propulsion Division of the Oklahoma City Air Logistics Center, Tinker Air Force Base, Oklahoma.

U.S. AIR FORCE

LPF-QAR- 001
GENERAL QUALITY ASSURANCE DOCUMENTS FOR F100 ENGINE FC/DC BREAKOUT COMPONENTS

1. APPLICATION.

These requirements apply to all F100 engine Fracture Critical Parts (FCP) and Durability Critical Parts (DCP).

2. PURPOSE.

2.1. This document establishes the minimum technical requirements the Offeror must satisfy to obtain engineering approval of their quality system for FCP/DCP applications. All documentation provided as evidence of compliance with requirements specified herein must be in English and in the Inch-Pound system. Engineering approval of Offeror's Quality Assurance System shall be valid for three years from the date of the OC-ALC letter notifying the contractor of approval.

3. REQUIREMENTS.

3.1. The Offeror must provide a Quality Assurance Manual that accurately portrays their current quality assurance system.

3.1.1. The Offeror's Quality Assurance System must comply with the requirements as described in this document and NATO AQAP-120, ISO 9002, ANSI 9002, or equivalent. Proof of compliance shall be provided and meet one of the following:

3.1.1.1. Certified to NATO AQAP-120, ISO 9002, or ANSI 9002 by the American National Standards Institute (ANSI) or the International Standards Organization (ISO) in Geneva, Switzerland, or

3.1.1.2. Approved by an Original Equipment Manufacturer (OEM) to an equivalent Quality Assurance System standard.

3.1.1.3. Evidence from DCMC or other appropriate government Quality Assurance Representative that Quality System is compliant to NATO AQAP-120, ISO 9002, ANSI 9002, or equivalent.

3.1.2. Proof of certification/approval must be provided and must be dated within the last three years. The decision to approve or disapprove the Quality Assurance

System shall only be made after a thorough review of the Offeror's Quality Assurance Manual by the cognizant engineering authority, OC-ALC/LPFR.

3.2. The Offeror must provide OEM documentation identifying the specific conditions/restrictions (i.e., specific P/Ns, components, processes, or material this status applies to, production testing required for material release, testing the supplier is authorized to perform, etc.) imposed by the OEM.

3.3. The Offeror must provide proof that their quality assurance plan has placed emphasis upon controlling processes to prevent generation of non-conformances and is supplemented by sufficient inspections or tests to assure effective process control.

3.4. The Offeror must provide procedures/specifications governing the control of significant processes proposed for use in the fabrication/repair of the approval item for assuring that:

3.4.1. Only Purchaser approved sources are used for raw material, significant processes, and major sub-components and adequate consideration is given to a source's capability and performance prior to placing an order.

3.4.2. The quality acceptance standards imposed in routine production acceptance both in-house and by sub-vendors are complete and approved by an OEM and the test methods employed in routine production acceptance are sufficient to verify compliance with these standards.

3.4.3. Fabrication performed in-house and by sub-vendors is accomplished in accordance with work instructions specified in manufacturing/repair process sheets, schedules, and/or technical control plans which define the exact sequence of all production operations and all process variables and all critical parameters of manufacturing/repair operations which may directly affect material structure, mechanical properties, surface finish and/or direction or lay of the cutting action. The procedure shall also assure that work instructions have been approved by the customer.

3.4.4. All inspection of characteristics, which serves as the basis for final acceptance of a characteristic, including in-process inspections, are performed in accordance with work instructions specified in inspection method sheets which define all characteristics specified on the applicable OEM drawings and Quality Assurance Documents (QAD's), the classification of each characteristic, the Acceptable Quality Level (AQL) for each classification of characteristic, sample size, frequency of inspection, the specific inspection methodology to be utilized, and the required instrumentation. The procedure(s) shall also assure that all inspection method sheets have been approved by the customer.

3.4.5. The Offeror must provide evidence that internal and sub-vendor audits have occurred, are adequate to insure quality of the end item and are addressed in the Offeror's Quality Plan. Specific Offeror audit procedures/guidelines which pertain to process and product audits shall, as a minimum substantiate the following:

3.4.5.1. Processes accomplished in-house shall be performed in accordance with work instructions specified in Manufacturing/Repair Process Sheets, Schedules, and/or Technical Control Plans which define the sequence of all production operations and all aspects and parameters of manufacturing/repair operations which may directly affect material structure, grain flow, mechanical properties, surface finish and/or direction or lay of the cutting action. The procedure(s) shall also assure that process sheets have been approved by the Purchaser or the OEM.

3.4.5.2. All inspection of characteristics, which serves as the basis for final acceptance of a characteristic, including in-process inspections, are performed in accordance with work instructions specified in Inspection Method Sheets which define all characteristics specified on the applicable OEM drawings and Quality Assurance Documents (QADs), the classification of each characteristic, the Acceptable Quality Lever (AQL) for each classification of characteristic, sample size, frequency of inspection, the specific inspection methodology to be utilized, and the required instrumentation. The procedure(s) shall also assure that all inspection method sheets have been approved by the Purchaser or OEM.

3.4.5.3. Unauthorized changes to work instructions which might directly affect the material structure, grain flow, mechanical properties, surface finish and/or lay of the cutting action or accuracy or reliability of component inspection must be approved the cognizant Fighter Propulsion System, Engineering Source Approval Section prior to production. The procedure(s) shall include responsibility, methods, and procedures for identifying significant changes in inspection methods or criteria, coordination internal approval of such changes, and assuring changes are not introduced in the production cycle without formal Purchaser approval. The procedure(s) must address processes performed by sub vendors as well as those performed in-house.

3.4.5.4. Strict adherence to the sequence, parameters, and all other significant process variables of manufacturing/repair operations defined on manufacturing/repair process sheets approved by the customer is maintained both in-house and at sub-vendors' facilities. Specific procedures for auditing and/or controlling requisite significant processes must be provided.

3.4.5.5. Dedicated equipment is properly maintained and calibrated IAW ISO 10012-1 and is capable of adequately performing its intended application.

3.4.5.6. General housekeeping and manufacturing/repair practices shall be addressed in the Quality Plan to ensure they do not adversely affect the quality of the end product.

3.4.5.7. In- process monitoring of principal manufacturing/repair and inspection practices, operating parameters, and process parameters which directly affect material structure, grain flow, mechanical properties, surface finish, lay of the material, and/or critical dimensions, and which are indicators of process effectiveness and efficiency. It shall include responsibility, methods and procedures for identifying variables and parameters to be monitored, developing and approving work instructions, identification of trends that signal process problems, and initiation of corrective actions.

3.4.6. Procedures for assuring that certificates of test or conformance provided by sub-vendors of raw material and significant processes are complete and supported by process data and numerical test results from an OEM-approved laboratory for the requisite testing, are representative of material received, and the material is in conformance with Purchaser requirements.

3.4.7. Adequate records are retained for documenting sub-vendor lists, sub-vendor quality ratings, layout inspection reports, all Purchaser and OEM approvals, component traceability, and objective evidence of conformance to product, process, and quality acceptance requirements; and are available to the Purchaser upon request.

3.4.7.1. Provide procedures for assuring the traceability of the repair history for repaired components.

3.4.8. Evidence of a system for controlling non-conforming material to ensure:

3.4.8.1. The classification of all non-conforming characteristics in terms of critical, major, and minor is approved by the Purchaser.

3.4.8.2. Final disposition of all non-conforming critical and major characteristics including rework and repair is approved by the Purchaser prior to implementation.

3.4.8.3. Effective control of non-conforming material at sub-vendor facilities.

3.5. The Offeror must provide a specific Quality Plan as described in the applicable quality system of paragraph 3.1 and IAW OC-ALC/LPFR documentation as requested in the specific Qualification Requirement.

3.5.1. The Offeror's Quality Plan shall address specifically how the Offeror intends to ensure the ongoing quality of the approval part and processes required in the manufacture/repair thereof and how this has been accomplished on similar components. The Quality Plan shall include the organization responsible for determining the requirements, factors typically considered in the determination, testing and surveillance conducted on sub vendors, testing laboratories used and the specific testing typically performed, subcontract quality requirements, and the specific paragraphs of the quality assurance document(s) that govern such aspects.

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U.S. AIR FORCE

LPF-QPR-004 LPFR QUALITY PLAN REQUIREMENTS FOR WELDED ASSEMBLIES

1. APPLICATION.

1.1 This plan applies to all F100 engine welded assemblies that are used in structural applications and are classified as fracture critical or durability critical parts.

2. PURPOSE.

2.1 This document establishes the minimum documentation required for a quality plan for the purpose of assuring that effective process control is maintained for the specified applications. All documentation provided as evidence of compliance with requirements specified herein shall be in English.

3. REQUIREMENTS.

3.1 **General**. The Offeror shall submit a Quality Plan specifically tailored to F100 engine applications requiring fusion and/or resistance welding. The Quality Plan shall be identified by: document number, issue date, and revision date. AWS D17.1, Specification for Fusion Welding for Aerospace Applications and MCL data shall be used for performance, procedure and personnel qualification. Where conflicts occur, the most stringent requirement shall apply.

3.2 **Purchasing**. Specific purchase order requirements to be imposed on subvendors of welding, weld filler material, heat treatment, cleaning, radiographic inspection, fluorescent penetrant inspection, and laboratory testing to control processing and production acceptance testing. The requirements shall address certification and control of weld processes, control of weld filler rod, certification of welders and NDT personnel, processing of significant process changes, maintenance of heat identification, production acceptance testing to be performed, acceptance/rejection criteria, and testing frequency.

3.3 **Overtesting**. Overtesting shall be conducted in addition to the production acceptance testing conducted by the process supplier. A detailed test plan shall be included for specific overtesting/overinspection to be conducted by or under the direction of the Offeror, on welds and heat treated material when these processes are subcontracted. In the event these processes are performed in-house the test plan shall define in-process testing and overtesting performed as quality assurance measures. More extensive overtesting shall be required on material, which is subcontracted for welding and/or heat treatment. The test plan(s) as a minimum shall include the following:

3.3.1 Identification of test specimen type (actual production article, scrapped parts, integral test piece, or separate representative test piece), description (configuration and dimensions), and heat treat condition.

3.3.2 Frequency of overtesting. For welds the plan shall specify frequency per weld process, material group and joint type.

3.3.3 The specific testing to be conducted on each specimen and the acceptance/rejection criteria. Overtesting and in-process inspection shall include microexamination of weld cross sections including the heat-affected zone, per MCL sections and AWS D17.1 Class B, unless otherwise specified, where conflicts occur, the most stringent shall apply.

3.3.4 Identity of the laboratory(ies) to conduct the testing. The Offeror shall substantiate that the laboratory is a P&W-approved laboratory for the specific testing required and has access to all applicable MCL sections pertaining to acceptance/ rejection standards and AWS D17.1/B2.1. Laboratories utilized for overtesting shall be autonomous from the source responsible for production acceptance testing. The plan shall also address any additional nondestructive testing, i.e, radiographic, FPI to be conducted as an overinspection by a source autonomous from the source that performed the production acceptance testing. The Offeror shall substantiate that P&W approved the laboratory and NDT source(s).

3.3.5 Identity and background of personnel responsible for reviewing the results of radiographic inspection and laboratory testing including metallography.

3.3.6 Procedures for identification of test pieces, retention of test pieces, and retention of test data.

3.4 **Audits**. Specific procedures shall be provided for performing on-site audits of sources of welding, heat treat, and radiographic inspection, and fluorescent penetrant inspection, including the Offeror, which shall as a minimum identify:

3.4.1 The specific procedures, guidelines and checklists for conducting on-site process audits of sources of cleaning, welding, heat treatment, and NDT including furnace control and the frequency at which they will be conducted. For fracture critical parts, process audit procedures shall also be provided for laboratory testing.

3.4.2 The specific procedures, guidelines and checklists for conducting on-site product and system audits of sources of welding, heat treatment, and NDT, and the frequency at which they will be performed. For fracture critical parts, the Offeror shall also identify similar procedures for laboratory testing.

3.4.3 The specific procedures identified shall also be provided with the Quality Plan unless previously provided. In the event that they have been previously provided the Offeror shall so indicate.

3.4.4 The personnel conducting the audits including their specific background and experience relative to the processes and products to be reviewed.

3.4.5 Procedures for promptly notifying OC-ALC/LPFR of major deficiencies noted during audits.

3.5 **Certification and Control of Weld Processes.** The Offeror shall provide the following procedures:

3.5.1 A Procedure Qualification Record (PQR) per AWS B2.1 and the master weld process procedures, which as a minimum include the method and materials for cleaning each material group, establishment, qualification, and control of operation sheets and weld schedules, in-process inspections for assuring process control, calibration of welding equipment, control of weld filler rod, repair of welds, and maximum number of passes allowed. The welders must be certified per AWS D17.1, to the specific materials, specific thickness, specific joint type (groove, fillet, etc.), and position. When Class A welds are specified by class or equivalent inspection criteria, the welder must be certified to Class A inspection criteria.

3.5.2 Specific procedures for training of welders.

3.5.3 Certification procedures for welders per AWS D17.1 (including recertification) and a PQR per AWS B2.1 and Welding Procedure Specification (WPS), including, for the grouping of materials and joint types for certification purposes, identification of test specimens (representative test pieces, scrapped parts, etc.), configuration of test specimens, number of passes, maximum number of qualification tests the operator is allowed to fail before becoming ineligible, the specific testing performed, and the acceptance/rejection criteria for each test.

3.5.4 Welder certification procedures shall identify the time between certifications, the organization responsible for the certification, the agency to which the certification is traceable.

3.6 **NDT Quality System.** The specific quality system procedures for each NDT process required in the inspection of welds on the approval item shall be provided. In cases where the required NDT process is performed by a subvendor, procedures shall be provided for assuring that an adequate NDT Quality System is maintained. The procedures shall comply with LPF-QPR-018, and as a minimum shall include:

3.6.1 Process control procedures for each NDT process.

3.6.2 Specific procedures for certifying and training NDT personnel.

3.6.3 Calibration procedures for NDT gage standards including working masters and transfer masters. These procedures shall provide assurance that working masters are properly calibrated with transfer masters that have been properly calibrated with the grand master.

3.6.4 The certification procedures shall identify the time between certifications, the organization responsible for the certification, the agency to which the certification is traceable.

3.7 **Processing Nonconforming Material.** Procedures shall be provided for processing nonconforming welds including repair procedures and procedures for promptly notifying OC-ALC/LPFR of major nonconformances.

3.7.1 **Traceability.** Provide specific plan for assuring the traceability of the welded assembly by serial number, to the original master heat.

4. RECORD RETENTION.

4.1 The Offeror shall maintain all applicable records for a period of five (5) years from the date of delivery of products/services.

5. STANDARD PRACTICES

5.1 Welding Wire.

5.1.1 **Certification**. All welding wire must be received into each shop shall be logged into Welding Wire Data Sheet. The Data Sheet shall contain Alloy, Lot #, Date Received, Manufacturer, Quantity (lbs.), Wire Dia., Tag or Paint marked, Date to Chem. Lab, and Date Approved by Chem. Lab. Shop lot #'s shall be assigned to lots received with no documentation and must be verified. Records must be kept for 5 years.

5.1.2 **Labeling.** All weld wire shall be color coded or tagged to reflect the proper alloy, IAW AMS 2815 or 2816.All welding wire received that is not "flag tagged" with the material spec # shall be color coded.

5.1.3 **Storage.**

5.1.3.1 **Material in use**. Welding wire must be stored in a clean dry cabinet. All welding wires must be clearly separated by material, size and lot #, and then clearly labeled with Spec, noun, and lot #. Only one (1) Lot # or Batch # shall be kept in the bin. Only one lot # per alloy and wire diameter shall be stored in bin. The lot # in the bin must be disbursed before another lot# package is opened. Welding wire daily quantities shall be disbursed to the welder along with a spec and lot number label. Wire disbursed may not be returned to the storage location under any circumstance. All stubs remaining at the end of the day shall be discarded in accordance with local regulations.

5.1.3.2 **Material in inventory.** Welding wire in inventory shall be kept in a separate cabinet and wire must be kept in original package and labeling.

5.1.4 **Workstation Log.** Welders shall maintain a Workstation log book of work, which includes the Date, Part Number #, S/N, Alloy wire used, Size, and Weld wire Lot #, WPS #.

5.1.5 **Workstation Wire Storage Canisters.** Welding wire in a booth shall be limited to the wire to be used in working day. Wire shall be stored in sealed canisters with lids. The "spec # and lot# label" shall be affixed to the canisters for the specific wire. Mixing of alloys or sizes is not allowed.

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SAMPLE WELDING PROCEDURE SPECIFICATION (WPS)

WPS- PROCESS SHEET #: _____
DATE: _____
REVISION: _____

SUPPORTING PQR #: _____
Welding process (es) _____

TYPE Manual: ( ) Machine ( ) Semi-Automatic: ( ) Automatic: ( )
EQUIPMENT TYPE AND MODEL #: _____
BACKING: Yes ( ) No ( )

[redacted] **To Base Material "B"**
Material # _____ Group _____
Material spec and grade: _____

Base Material thickness range: Groove: _____ Fillet: _____

JOINT DESIGN: _____
Deposited weld material thickness range:
Filler Material Specification:
Position(s) of joint:
Welding progression:

WELD INCREMENT SEQUENCE: _____
_____
_____

Up ( ) Down( )

GAS:
Shielding gas (es): Argon % composition: 99.99
Root shielding gas:
Trailing gas composition:

Flow rate:
Flow rate:
Flow rate:

FIXTURES:
Holding:

Root shielding:

PROGRAM NAME OR NUMBER:
WELDING PARAMETERS:

Electrode diameter:
Torch type/ orifice/ cup size / angle
Electrode standoff distance:
Amp range:
Polarity
Volt range
Travel speed:

POSTWELD HEAT TREATMENT:

NDI PROCEDURES:

SAMPLE PROCEDURE QUALIFICATION RECORD (PQR)

PQR #: _____
DATE: _____

Welding process (es) _____

TYPE Manual: ( ) Machine ( ) Semi-Automatic: ( ) Automatic: ( )
EQUIPMENT TYPE AND MODEL #: _____
BACKING: Yes ( ) No ( )

To Base Material "B"

Material # _____ Group _____
Material spec and grade: _____
Chemical Analysis Report: _____

Base Material thickness range: Groove: _____ Fillet: _____

JOINT DESIGN: _____
Deposited weld material thickness range:
Filler Material Specification: _____
Position(s) of joint: _____
Welding progression: Up ( ) Down( )

WELD INCREMENT SEQUENCE: _____

GAS:
Shielding gas (es): Argon % composition: 99.99
Root shielding gas:
Trailing gas composition:

Flow rate:
Flow rate:
Flow rate:

FIXTURES:
Holding:

Root shielding:

PROGRAM NAME OR NUMBER:
WELDING PARAMETERS:

Electrode diameter:
Torch type/ orifice/ cup size / angle
Electrode standoff distance:
Amp range:
Polarity
Volt range
Travel speed:

POSTWELD HEAT TREATMENT:

NDI PROCEDURES:

TENSILE TEST SPECIMENS

Tensile specimen size: _____ Tensile test results: _____ UTS

[redacted]	Width, in.	Thickness, in.	Area in^2	Max load, lbs.	UTS, psi	Type of failure & location

[redacted] TEST

Specimen size:

Type	Result	Type	Result

[redacted] ATION

1. 3.
2. 4.

[redacted]

1 3
2. 4.

[redacted]

Type: Size: Test Temp.
[redacted]ation WM = Weld Metal BM= Base Metal HAZ= Heat Affected Zone

[redacted] position	Specimen Location	Energy absorbed (ft-lb)	Ductile Fracture Area (%)	Lateral Expansion (mils)

[redacted] TEST

VALUES

[redacted]

ACCEPTABLE: UNACCEPTABLE:

CHEMICAL ANALYSIS

ACCEPTABLE UNACCEPTABLE:

NON-DESTRUCTIVE ANALYSIS

METHOD:

ACCEPTABLE UNACCEPTABLE:

MECHANICAL TESTING BY:

QUALIFIER: _____ DATE:

PQR SAMPLE – PAGE 2

LPF-QR-001
BASIC TECHNICAL DATA REQUIREMENTS FOR FRACTURE CRITICAL AND DURABILITY CRITICAL PARTS

1. APPLICATION.

This specification applies to all F100 engine Fracture Critical Parts (FCP) and Durability Critical Parts (DCP).

2. PURPOSE.

2.1. This document is a supplement to established Qualification Requirements (QR) tailored to a specific part(s) for the purpose of defining the basic documentation required of prospective sources to substantiate proof of capability. It is not all inclusive and prospective sources shall note that satisfaction of all requirements defined by the specific QR applicable to the approval part is required to obtain engineering source approval. The basic documentation submitted by prospective sources shall be tailored to the requirements of the specific QR applicable to the approval part that defines specific criteria for proof of capability. All documentation provided as evidence of compliance with requirements specified herein shall be in English and in the Inch-Pound system.

2.2. QR's applicable to a specific part shall be made available to prospective sources upon request to OC-ALC/BC for parts which are not the subject of open solicitations. Requests concerning the latter shall be addressed to the procuring activity.

2.3. Prospective sources are advised that source approval consideration on most Fracture Critical Parts (FCP) is restricted to actual manufacturers of the approval part due to limitations in existing government expertise. Consequently, prospective sources are advised to verify as to whether or not the part(s) in which they are interested fall in this category prior to seeking source approval. Information in this regard may be obtained through OC-ALC/BC at any time or the procuring activity.

3. DEFINITIONS.

The following definitions shall apply as used in the context of QR's for Fracture Critical Parts and Durability Critical Parts unless otherwise stated in the specific QR.

3.1. **Approval Part/Item -** Part/Item for which source approval is sought.

3.2. **Category 1 Offeror -** A manufacturing/repair source, which in conjunction with their sub-vendors has performed all requisite processes on the approval part for Pratt & Whitney. Offerors in this category must provide documentation relevant to the approval part that satisfies all criteria specified under Proof of Capability in their respective QR's with the exception of those identified in 5.1.1, 5.1.2, and 5.2. In all cases the burden of proof shall reside with the Offeror. Approval by the OEM for a specific repair or item manufacture does not guarantee approval by OC-ALC/LPFR. Sub-vendors are subject to approval by OC-ALC/LPFR.

3.3. **Category 2 Offeror -** Manufacturing/Repair source, which in conjunction with their sub-vendors has performed all requisite processes on a similar part for an OEM. Offerors in this category must provide documentation relevant to a similar part(s) that satisfies all criteria specified under Proof of Capability. In all cases, the burden of proof lies with the Offeror. Approval by the OEM for a specific repair or item manufacture does not guarantee approval by OC-ALC/LPFR. Sub-vendors are subject to approval by OC-ALC/LPFR.

3.4. **Critical Characteristic -** A part feature which, if non-conforming would result in probable loss of aircraft due to direct part failure or by causing other progressive part failures.

3.5. **Durability Critical Part -** A highly stressed part which cannot be completely inspected nondestructively; failure of which will result in a significant maintenance burden.

3.6. **Fabricate -** The manufacturing steps necessary for the making of new parts.

3.7. **Fracture Critical Part -** A highly stressed part which cannot be completely inspected nondestructively; failure of which will result in loss of aircraft due to non-containment or power loss preventing sustained flight, as a direct result of part failure or subsequent progressive failures.

3.8. **Inspection Method Sheets (IMS) -** document used to describe the steps involved in executing an inspection or series of inspections to include tooling, gages, fixtures, dimensions and other parameters necessary to execute the required inspections(s).

3.9. **Major Characteristic -** A part feature which, if non-conforming, could compromise the function of the part, resulting in a significant maintenance burden and/or reduction in weapon system performance.

3.10. **Manufacturing/Repair Process Sheets (MPS/RPS) -** documents used to describe the steps involved in executing an operation or series of operations to include tooling, machinery, dimensions, speeds, feed rates, coolants, cutters, tape

numbers and other operating, process and/or set-up parameters necessary to execute the operation. At a minimum processes in Appendix A shall be fully defined.

3.11. **Material -** A general term referring to material at any stage in the manufacturing/repair process.

3.12. **NIST -** National Institute of Standards and Technology.

3.13. **Offeror -** Source furnishing a source approval package in an attempt to obtain engineering source approval to supply the approval part in its finished state to OC-ALC.

3.14. **Original Equipment Manufacturer (OEM) -** Term typically applied to the source responsible for the original design and development of a product or system. In this case it shall refer to sources primarily responsible for the design and development of aircraft gas turbine engines similar to the Pratt & Whitney F100 engine, for a US DoD activity or a NATO country.

3.15. **Production Quantities -** Quantities that establish a reasonable level of confidence in a prospective source's ability to consistently produce parts whose integrity is equivalent to that exhibited by parts that originally passed substantiation testing. As a minimum it shall be considered representative of several production lots or greater quantities commensurate with those specified in current solicitations or OC-ALC annual buy projections and shall be exclusive of quantities produced in experimental or developmental programs.

3.16. **Purchaser -** The Purchaser as defined in all applicable government specifications as well as all PWA specifications relative to the part described in this document shall refer to the OC-ALC contracting activity issuing the procurement requirement.

3.17. **Raw Material -** Ingot, bar, billet, or sheet stock used directly in the fabrication of the finished part or forgings/castings used in the fabrication of the finished part.

3.18. **Repair -** The processes and inspections necessary to restore parts to serviceable condition.

3.19. **Significant Process -** A process which is capable of producing alterations in the material structure of a part which cannot normally be evaluated without destructive testing and which can compromise the mechanical properties `and ultimately the reliability of the part. Examples of processes that are considered to be significant by OC-ALC are listed in Appendix A.

3.20. **Similar part -** A part that satisfies all of the specific criteria for similarity as defined in the QR's for the approval part.

3.21. **Sub-vendor** - A source supplying material, products, and/or services to the Supplier as required in the performance of the contract. This term applies to all facilities other than the Supplier's facility including those of the same company.

3.22. **Technical Order** - A technical manual published by the Air Force containing (in this case) technical information required to develop inspection methods and repair processes for aircraft engine parts.

4. SOURCE SUBSTANTION AND QUALIFICATION

4.1. Offerors must:

4.1.1. Document processes and sequences to be used.

4.1.2. Controls of significant/major changes.

4.1.3. Statistical process control of significant processes (ensure same sequence and same operations)

4.1.4. First Article Inspection

4.2. **Quality management shall have standard practices and enforcement, which are commensurate with the requirements specified by the Qualification Requirements:**

4.2.1. Part outsourcing

4.2.2. Software quality

4.2.3. Material Review Board (MRB)

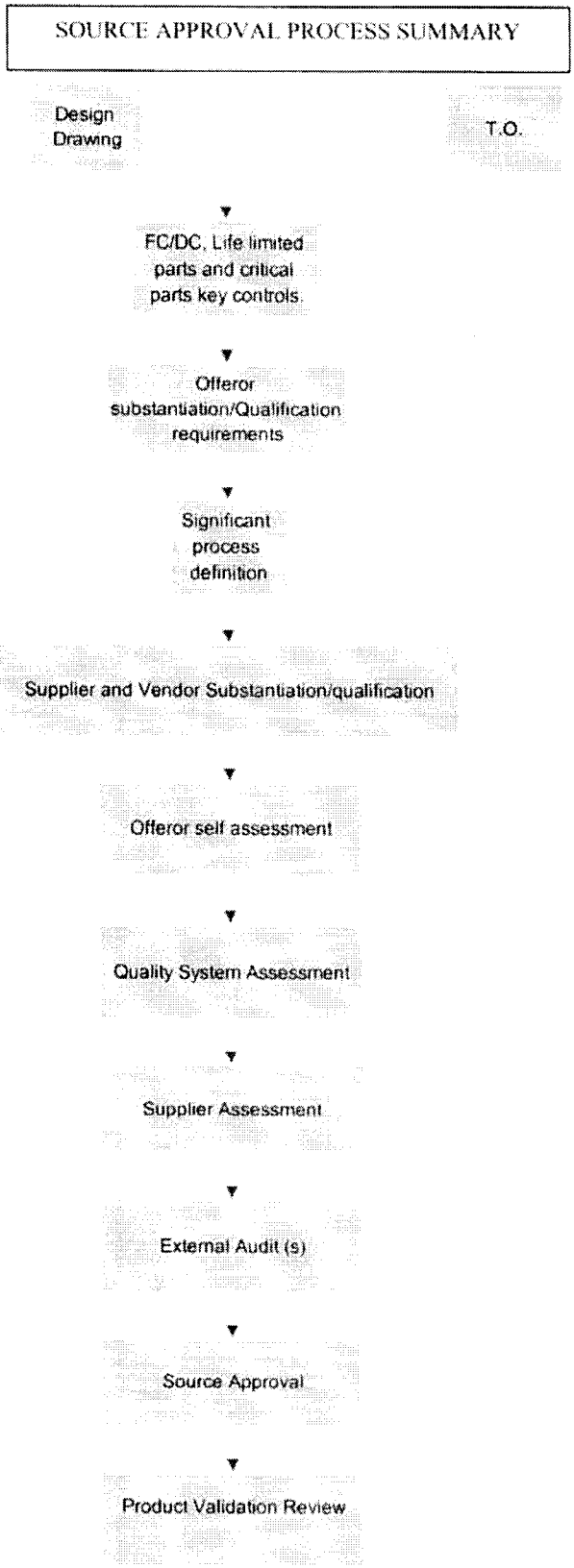
4.2.4. Farming-out of processes

4.2.5. Corrective Action and Root Cause Investigation

4.2.6. Drawing conformance

4.2.7. New item and item repair quality audits.

4.2.8. Part Marking.


SOURCE APPROVAL PROCESS SUMMARY
Design Drawing
T.O.
FC/DC, Life limited parts and critical parts key controls
Offeror substantiation/Qualification requirements
Significant process definition
Supplier and Vendor Substantiation/qualification
Offeror self assessment
Quality System Assessment
Supplier Assessment
External Audit (s)
Source Approval
Product Validation Review

5. DOCUMENTATION REQUIREMENTS.

5.1. Offerors must submit the following data on all parts referenced within their SAR in addition to data required in the QR:

5.1.1. Offerors self-assessment of quality program and areas of improvement.
5.1.2. Quality System description and how it meets this programs requirements
5.1.3. Supplier assessment and qualifications, and include a plan for how suppliers and vendors will maintain the approved quality program and statistical process control
5.1.4. External audits shall be conducted by the OEM and/or OC-ALC/LPFR.

5.1.5. A complete set of legible drawings for all assemblies, details, and sub-components. All dimensions shall be in the English System of Units.

5.1.6. A complete set of all specifications (top page only for Pratt & Whitney developed specifications) for all materials and manufacturing/repair processes identified on the drawings for the similar parts and sub-components thereof.

5.1.7. Substantiation of possession or the top page of all referenced Pratt & Whitney MCL standards.

5.1.8. Approval by the OEM for a specific repair does not guarantee approval by OC-ALC/LPFR. Sub-vendors are subject to approval by OC-ALC/LPFR.

5.2. Offerors shall include the following documentation on the approval part (Category I Offeror) or similar parts (Category II Offeror) to substantiate Proof of Capability:

5.2.1. Copies of purchase orders from purchaser to Offeror and Offeror to sub-vendors that define quantities ordered and all technical conditions or restrictions imposed. Copies of the most recent shipping documents applicable to the purchase order should also be provided. Shipping documents shall be stamped appropriately by the purchaser to indicate full release where on-site acceptance is specified by the purchase order. In addition, if the part was manufactured/repaired for Pratt & Whitney, the Pratt & Whitney Requirements Control Card and Quality Assurance Document should be provided. The fact that a sub-vendor is a Pratt & Whitney LCS Supplier shall not relieve the Supplier of the responsibility of conducting following-on quality assurance surveillance to ensure that sub vendors are providing conforming material.

5.2.2. A copy of the Manufacturing/Repair Process Sheets (MPS) and Inspection Method Sheets (IMS) employed in the production of the part(s). Evidence of

purchaser approval of the MPS is required. Summary of manufacturing/repair operations sheets, travelers, or routing sheets are not acceptable in lieu of MPS, except for some sheet metal parts. In the case of the latter routing sheets that define process sequence, forming tooling, non-conventional machining schedules, weld schedules, and braze schedules shall be provided. All schedules and technical control documents referenced in the MPS that specify process operating parameters shall be included. In all cases where an operation is governed by software, i.e., numerically controlled or automated operations a hard copy excerpt identifying manufacturing/repair process operating parameters must be provided. MPS shall remain confidential and may be stamped "proprietary" at the discretion of the Offeror. Failure to provide detailed MPS and IMS shall constitute grounds for disapproval.

5.2.3. Identification of all sub-vendors of significant processes and sub-components employed in the production/repair of the part(s) including the specific operations and/or sub-components provided by each sub-vendor. Sub-vendors are subject to approval by OC-ALC/LPFR.

5.2.3.1. For significant processes subcontracted, the Offeror must provide his method for insuring quality control and conformance to specification at the sub-vendor's plant. This should not only include identification of such procedures in the company Quality Manual but also physical evidence such as audit reports, surveys, and chemical and physical test reports. If receiving inspection cannot verify conformance to specification, then chemical and physical test data along with in-work process control data must accompany each lot.

5.2.3.2. Repairs performed by sub vendors shall be accomplished in accordance with work instructions specified in MPS, Inspection Method Sheets, schedules, and/or technical control plans which define the exact sequence of all production operations and all process variables and parameters of repair operations which may directly affect material structure, grain flow, mechanical properties, surface finish and/or direction or lay of the cutting action. The procedure shall also assure that work instructions have been approved by the Purchaser or the OEM specified by the applicable source certification requirements defined in section 6.4 of these QR's.

5.2.3.3. Certificates of test or conformance provided by sub vendors of significant processes are complete and supported by process data and numerical test results from and OEM-approved laboratory for the requisite testing, are representative of material received, and the material is in conformance with Purchaser requirements. Acceptance of incoming material based exclusively upon certificates of test/conformance shall be prohibited. Also, generic procedures such as "laboratory testing employed as necessary" are unacceptable. Specific test procedures utilized on wrought engine parts are required.

5.2.4. A summary of quality deficiencies experienced in fabrication/repair part during the last two years of production. The summary shall include but not be limited to all Material Review Board (MRB) actions, Quality Deficiency Reports (QDR's), Laboratory Quality Review Orders (LQROs), Supplier Report of Nonconformance (SRONs), Material Deficiency Reports (MDR's) and any other pertinent documentation as well as the coordination of the President or Facility General Manager, and the Quality Assurance Manager. Coordination of the government quality assurance representative shall be included as well if government source inspection was conducted. Actions taken to resolve deficiencies identified including repair, rework or replacement of parts as well as the source primarily responsible for initiating, developing, and implementing corrective actions and the status thereof must also be provided.

5.2.4.1. The quality acceptance standards imposed in routine production acceptance by sub vendors shall be complete and OEM approved and the test methods employed in routing production acceptance are sufficient to verify compliance with these standards.

5.2.5. A detailed description of major similarities and differences between the "similar" part(s) and the approval part.

5.2.6. A specific description of value added by the OEM to the approval part or similar part(s) including but not limited to performance of manufacturing/repair processes or inspections, supply of raw material, forgings, castings, or sub-components, quality assurance surveillance of sub-vendors of significant processes, use of OEM tooling, fixtures, gages, or inspection master hardware, and use of OEM MPS, IMS or other process related data not referenced on part drawings. The Offeror shall demonstrate capability to fulfill " value added " by Pratt & Whitney on the approval part as determined by OC-ALC/LPFR, as the cognizant OC-ALC Fighter Propulsion System Division Engineering Section.

5.2.7. A copy of summary of manufacturing/repair process sheets, travelers, or routing sheets that identify all *significant manufacturing/repair* processes **to be employed in the fabrication/repair of the approval part** for OC-ALC. This documentation is subject to approval by OC-ALC/LPFR. As such it shall include a provision for coordination on each page.

5.2.8. Identification of all proposed changes to the MPS and IMS submitted by Category I Offerors, as proof of capability. This requirement applies regardless of whether are not they are considered to be significant changes by the Offeror.

5.2.9. The Offeror must provide documentation to prove that their quality assurance system meets or exceeds the requirements as described in the attached document LPF-QAR-001.

5.2.10. If an Offeror has had a Quality or Process audit performed by the DoD or agent for the DoD in the last 3 years, the Offeror shall provide the findings and evaluation/rating.

5.3 TRACEABILITY

5.3.1 Fracture Critical Parts must also provide traceability to critical processes specified in Appendix A, so that quality escapes may be easily narrowed to a population.

6. SAR FORMAT.

6.1. Source Approval Requests (SAR's) should be submitted in a binder to preclude the loss of contractor data in handling. A hard or semi-hard cover notebook form (i.e. a three-ring binder or similar product), with a table a contents and tabs corresponding to the table of contents is preferable. This will significantly reduce the turn-around time for engineering evaluation as well as reduce the likelihood of oversight or loss of valuable data that could have a significant bearing on the outcome of the evaluation.

7. PRODUCT VALIDATION REVIEWS AFTER CONTRACT AWARD.

7.1. Contractor must provide an internal review and report for:

7.1.1. Measure changes from First Article Inspection/Product Verification Audit

7.1.2. Conduct review 6 months after contract award or 25 parts, whichever comes first.

7.1.3. Review

7.1.3.1. Print, planning operations, and part review

7.1.3.2. Measure process capability standards for critical processes and critical features.

7.1.3.3. MRB procedures

7.1.3.4. Corrective action reports, assessments, and timely action.

7.1.3.5. Visual inspection by Part Number

7.1.3.6. Part Marking

7.2. The Government and/or the OEM will perform these reviews as necessary to ensure compliance.

GRIZELDA LOY-KRAFT, Chief
F100 Engineering Source Approval
Fighter Propulsion Division
Propulsion Directorate

APPENDIX A

CRITICAL/SIGNIFICANT PROCESSES

The following examples are typical processes considered significant in that they are capable of producing alterations to material structures, mechanical properties, and ultimately, item reliability, if performed improperly, and cannot normally be evaluated without destructive testing.

MANUFACTURING ONLY:

1. Casting Processes
2. Forging Processes
3. Other Forming Processes
4. Broaching

MANUFACTURING & REPAIR:

5. Blending/Reworking
6. Heat Treatment and Surface Hardening Processes
7. Grinding
8. Drilling, Reaming, and Boring
9. Milling
10. Finish Turning
11. Electrochemical Machining Processes (Cavity Sinking, Drilling, Grinding, etc.)
12. Chemical Milling
13. Electro-Discharge Machining
14. Electro-Stream Drilling
15. Laser Beam Metal Removal Processes
16. Electron Beam Processes
17. Peening Processes
18. Welding/Fusion
19. Brazing
20. Soldering

21. Metal Electroplating Processes
22. Coating Processes including, but not limited to, the following:
    a) Plasma Spray
    b) Thermal Spray,
    c) Diffusion Coatings
    d) Thermal Barrier Coatings
23. Surface Finishing Processes including, but not limited to, the following:
    a) Honing
    b) Sutton Barrel
24. Blasting Processes including, but not limited to, the following:
    a) Aluminum Oxide
    b) Silicon Carbide
    c) Plastic Bead
    d) Glass Bead
25. Dimensional Inspection/Tolerancing
26. Non-Destructive Inspections, including, but not limited to the following:
    a) Fluorescent Penetrant
    b) Eddy Current
    c) Ultrasonic
    d) Laser Holography
    e) Magnetic Particle Inspection
    f) Visual Inspection
    g) Radiography

27. Water-jet Stripping
28. Assembly Procedures
29. Disassembly Procedures